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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/468,668	12/21/1999	JAMES A. KWEEDER	30-4874	3902

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EXAMINER
MADSEN, ROBERT A

ART UNIT	PAPER NUMBER
1761	16

DATE MAILED: 07/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/468,668	Applicant(s) KWEEDER ET AL.	
	Examiner Robert Madsen	Art Unit 1761	

-- Th MAILING DATE of this communication appears on th cover she t with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 April 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13 and 15-17* is/are pending in the application.

4a) Of the above claim(s) *11-13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,15-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. The Amendment filed April 17, 2003 has been entered. Claims 1-13, 15-17 remain pending with claims 11-13 being withdrawn from further consideration as drawn to a non-elected invention in paper no.3.

Specification

2. The amendment filed April 17, 2003 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is "mechanically agitating the shear-thinnable mixture at a rate greater than about 200 revolutions per minute by means of an agitator". Mechanical agitation is discussed in a quantitative manner in four locations in the originally presented specification.

3. First, agitator speed is discussed on Page 4, lines 24-30 :

> As one example, ammonium sulfate nitrate (ASN) has been successfully prilled using a vertical, agitated prill head and using an agitated rotating bucket prill cup. In practice, 200 rpm (revolutions per minute) rotational speed in a vertical prill head or the simple incorporation of a stationary mixing blade inside a rotating bucket prill cup provides sufficient shear to achieve a prillable viscosity for ASN. The present invention should prove equally useful in any mixture that exhibits shear-thinning behavior.

4. "Sufficient" is defined by Merriam-Webster Online Dictionary as "enough to meet the needs of a situation or a proposed end". Thus, "200 rpm ...provides sufficient shear" does not exclude any speed lower than 200 rpm, exclude 200 rpm, or include speeds greater than 200 rpm. However, the added material "*greater than* about 200" rpm excludes 200 rpm and speeds less than 200 rpm. Therefore, this citation from Page 4 does not provide support for "mechanically agitating the shear-thinnable

mixture at a rate greater than about 200 revolutions per minute by means of an agitator".

5. Second, a correlation of viscosity and frequency is discussed on Page 6, lines 11-16 in light of Figure 2:

> Figure 2 shows rheological data for an equimolar ammonium nitrate (AN) /ammonium sulfate (AS) melt slurry. At very low shear frequency, the viscosity of the mixture is extremely high. As the shear frequency increases there is a dramatic decrease in viscosity.

6. Figure 2 comprises a graph of viscosity versus frequency in radians per second (each radian per second is equivalent to 9.55 rpm). Figure 2 does demonstrate the characteristics of a shear thinning material, but it is does not provide support to exclude 200 rpm or values lower than 200 rpm when applicant has already disclosed on Page 4, lines 24-30 that 200 rpm as sufficient shear.

7. Third, mechanical agitation via a rotating bucket and stationary agitator is disclosed in an example on Page 11, lines 19-21 (An Inventive Example) :

> The bucket was then spun around its central axis to a nominal speed of 500 rpm and a stationary agitator blade was inserted into the melt in the prill head (as illustrated in Figure 3).

Because this example teaches a bucket speed, and not an agitator speed, it does not provide support for "mechanically agitating the shear-thinnable mixture at a rate greater than about 200 revolutions per minute by means of an agitator" .

8. Fourth, agitator speed is discussed in an example on Page 12 , lines 19-21 (A Comparative Example C) :

> With the agitator operating at 600 rpm, the prill cup was closed and pressure applied with nitrogen to attempt to induce flow out of the holes. However, no flow could be achieved, even at pressures up to 50 psi.

This speed is associated with a *comparative* and *unsuccessful* example using smaller prill holes. Examiner agrees that the aforementioned Figure 2 provides support that as

agitation speed increases the viscosity decreases, but the unsuccessful prilling attempt at 600 rpm in light of Figure 2 does not provide support for "mechanically agitating the shear-thinnable mixture at a rate greater than about 200 revolutions per minute by means of an agitator" . Further, it is not clear from this example if a higher agitator speed would even be successful based on the small prill hole sizes.

9. Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 1-10,15-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. For reasons discussed above in paragraphs 2-8 there is no support in the originally presented specification for "mechanically agitating said shear-thinnable mixture at a rotational speed of *greater than* about 200 revolutions per minute by means of an agitator in a prill head" as recited in step (d) of amended claim .

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoogendonk (US 3083406) in view of Holland et al. (1995), Frenken et al. (US 3988398), and Otsuka et al. (US 3539326).

14. Regarding claims 1, 2,6,7, Hoogendonk teaches the general method of prilling molten fertilizer (e.g. NPK fertilizers or ammonium nitrate mixed with limestone or dicalcium phosphate) by mechanically agitating the molten mixture in a prill head with sweep agitators, which are conical rollers (See items 8 of Figure 1, Column 1, lines 9-21). To overcome the thixotropic nature of the molten mixture, prevent solids from blocking holes in the head (i.e. the mixture is a melt slurry as recited in claim 2), and allow for continuous prilling, both the head and agitators rotate at adjustable speeds, as recited in claim 6 (Column 1, line 54 to Column 2, line 15). Since Hoogendonk teaches the head rotates, the influence of a force would be centrifugal force. Hoogendonk is silent in teaching a shear thinnable mixture *per se*, a rotational agitator speed of greater than about 200 rpm , providing a first molten component, mixing with a second component and reacting the components for a time sufficient to form a shear-thinnable mixture, as recited in claim 1, or that the surface is swept by blades *per se* as recited in claim 7.

15. With respect to a shear thinnable mixture Holland et al. are relied on as evidence that thixotropic materials are shear thinning, as recited in claim 1 (Pages 52,53, and 55).

16. Frenken et al. teach a method to prill a molten NPK Fertilizer mixture by mechanically agitating the material in a prill head wherein essentially the entire liquid volume of the prill head is swept by an agitator, such as a wiping blade as recited in claim 7(See prill head 2 with holes 3 and pump impeller blades 5 in Figures 1 and 2, Abstract). Frenken et al. further teach mechanical agitation appropriate for molten fertilizer mixtures involves a rotational speeds of 300-2000 rpm for the blade (Column 2, lines 15-45), and an increase in head speed increases centrifugal forces to maintain a constant flow (Column 3, line 37 to Column 4 line 15). Therefore, it would have been obvious to agitate the mixture of Hoogendonk at an agitator speed of greater than about 200 rpm since Frenken et al. teaches 300-2000 rpm for the sweep agitator is an appropriate speed for prilling molten fertilizers in a prill head and one would have been substituting one speed for another for the same purpose: prilling fertilizers in a rotatable prill head with a rotatable sweep agitator. It would have been further obvious to modify the sweep agitator of Hoogendonk and include wiping blades, as recited in claim 7, since one would have been substituting one type of sweep agitator for another for the same purpose.

17. With respect to the individual steps of providing a first molten component, mixing with a second component and reacting the components, Otsuka et al. also teach prilling a molten mixture of fertilizers, such as NPK fertilizers as taught by Hoogendonk.

Otsuka et al. teach the conventional fertilizer melt slurry (e.g. an NPK fertilizer) is a melt (Column 1, lines 15-56) is made by the steps of providing a molten first component (e.g. ammonium nitrate), mixing at least a second component to with the first (e.g. phosphorous and/or potassium salts), reacting the components to form a mixture at a particular temperature and time (see especially Examples for time/temp combination, Column 7, line 19 to Column 8, line 34, Examples) , as recited in claim 1. Therefore, it would have been obvious to modify Hoogendonk and include the steps of providing a molten first component, mixing it with at least a second component, and reacting the two at a temperature and sufficient time to form a shear thinnable mixture, since Hoogendonk teaches prilling molten fertilizers and these are well known steps in preparing fertilizer melt slurries for prilling.

18. Regarding claims 4,5,9,10, Hoogendonk is silent in teaching a moisture level or micronutrients. However, Otsuka et al. are relied on as evidence of the conventionality of a fertilizer molten mixture used for prilling comprising 1-2% moisture as recited in claims 4 and 9 (Column 5, lines 1-20) and micronutrients as recited in claims 5 and 10 (i.e. Introducing calcium and magnesium values in Column 5, lines 43-53). Therefore, It would have been obvious to include 1-2% moisture and micronutrients since one would have been substituting one conventional prilled fertilizer melt composition for another.

19. Regarding claims 3 and 8, Hoogendonk is silent in teaching a first component is ammonium nitrate and a second component is ammonium sulfate. Otsuka et al. teaches such NPK fertilizers may comprise ammonium sulfate added to a melt solution of ammonium nitrate (Column 5, lines 43-53). Therefore it would have been obvious to

include ammonium nitrate as a first component and ammonium sulfate as a second component since one would have been substituting one conventional NPK fertilizer preparation step for another for the same purpose: prilling molten fertilizer.

20. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hoogendonk (US 3083406) in view of Holland et al. (1995), Frenken et al. (US 3988398), and Otsuka et al. (US 3539326) as applied to claims 1-10 above, further in view of Bassetti et al. (US 5378259).

21. Hoogendonk is silent in teaching the reaction time. Bassetti et al., like Hoogendonk also teach prilling ammonium nitrate mixtures. Bassetti et al. teach when 95% ammonium nitrate and 0.4% ammonium sulfate are reacted at 170°C-175°C the reaction time is 5-10 minutes (Example 1). Therefore it would have been obvious to have a reaction time between about 10 and 20 minutes since it was known to react ammonium nitrate and ammonium sulfate for about 10 minutes. To further select any other reaction time would have been an obvious result effective variable of the molar ratio of ammonium nitrate to ammonium sulfate and the temperature selected since these variables are notoriously well known in the art to affect reaction time.

22. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoogendonk (US 3083406) in view of Holland et al. (1995), Frenken et al. (US 3988398), and Otsuka et al. (US 3539326) as applied to claims 1-10 above, further in view of Stengel (US 3021207)

23. Hoogendonk is silent in teaching heating during a reaction to 180-200°C or equimolar amounts of both ammonium nitrate and ammonium sulfate. Like Hoogendonk, Stengel teaches mixed ammonium nitrate fertilizers and is relied as evidence of the conventionality of producing fertilizer particles comprising equimolar amounts of ammonium nitrate and ammonium sulfate (Column 1, lines 40-65) wherein the reaction temperature is preferably between 180-200°C (e.g. 188°C or 370°F) because the ammonium nitrate is more fluid, easier to handle, and easier to feed into the particle forming device (in the case of Stengel a cooling conveyor belt). Therefore, it would have been obvious to modify Hoogendonk and include equimolar amounts of ammonium nitrate and ammonium sulfate since one would have been substituting one known ammonium nitrate based fertilizer particle forming formula for another. It would have also have been obvious to run the reaction at 180-200°C since ammonium nitrate is easier to handle at this temperature.

Response to Arguments

24. Applicant's arguments filed April 17, 2003 have been fully considered but they are not persuasive.

25. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in

the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

26. Applicant argues that Hoogendonk does not teach a shear thinning melt obtained by the step of reacting and mixing two components for a sufficient time and temperature, and that Otsuka et al. is not combinable with Hoogendonk for providing guidance to follow the steps of forming the shear thinning melt as recited in the steps of claim 1a-1c because Otsuka et al. disclose combining materials in a melt and mixing causes melt viscosity to rise and teach against the use of a prill head with holes (nozzles), However, Hoogendonk teaches an NPK melt. Hoogendonk also teaches NPK melts have a thixotropic nature, and, as evidenced by Holland et al. , these melts are shear thinning. Even though Hoogendonk is silent in teaching the particular method of forming this shear-thinning NPK melt, applicant is not the first to form a melt comprising three components (e.g. sodium, phosphorous, and potassium sources) by providing a first molten component and mixing at least a second component, as recited in steps 1(a) and 1(b), or even reacting the components under a particular temperature and shear as recited in step 1(c). Otsuka et al. provide guidance as to how one obtains an NPK melt, and does teach the steps 1a-1c utilized in forming an NPK melt. While Otsuka et al. teach mixing at a particular time and temperature causes the viscosity to rise, Otsuka et al. further teach the mixture after "...then reaches a melting state of the lowest viscosity" (Column 2, lines 40-45), and is thus shear thinning. Additionally, while Otsuka et al. teach against the use of a prill head nozzle on an industrialized scale because of clogging, Otsuka et al. are relied on for the teaching the steps of preparing

an NPK melt, not for the subsequent prilling method utilized. Furthermore, the primary reference teaches a solution to NPK melts clogging prill heads.

27. Applicant also argues that Frenken et al. is not combinable with Hoogendonk to provide a blade sweep agitator at greater than 200 rpm because Franklin et al. require the blades are at a distance from the wall, and Hoogendonk requires them to be flush with the wall. Both Hoogendonk and Franklin et al. attempt to solve the same problem of the prior art with respect to prilling NPK melts: preventing clogging of a prill head using an interior sweep agitator so that a constant flow of prills out of the head may be maintained. In fact both references offer their inventions as an improvement over that of US Patent No. 3,055,049 (Hoogendonk: column 1, lines 21-38 and Frenken et al. : Column 1, lines 5-60). Thus, regardless of the volume mixed by either Hoogendonk or Frenken et al. , they both attempt to improve the same prior art device, and would be combinable as stated in the rejections above because one would be substituting one conventional agitation solution for another for the same art recognized problem: the device of US Patent No. 3,055,049.

Conclusion

28. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Madsen whose telephone number is (703)305-0068. The examiner can normally be reached on 7:00AM-3:30PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on (703)308-3959. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0061.

Robert Madsen
Examiner
Art Unit 1761
June 22, 2003

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